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Office of the Director

May 24, 1978

RG:0037

Mr. W. Y. Thompson, Chairman
Board of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Thompson:

PROPOSED HYDROELECTRIC PROJECT
WAILUA, KAUAI

In accordance with your 24 April request for a review on the Belt-Collins report of April 1978 in the above project, we provide the following comments. Mr. L. Stephen Lau, Director, Water Resources Research Center, has assisted in preparing the review.

General comments

Although to the general public, the prospects of further hydroelectric development in the Wailua disposal basin seem enticing, it is not surprising that the report concludes that such development is not economically promising. We wonder, indeed, whether a less extensive study than that represented by the report could not have resulted in the same general conclusions although it would not have produced such precise estimates of the benefits and costs of the project.

Relation of hydroelectric value to other values

On page iv of the report, it is stated "that the value of hydroelectric energy is far greater than the value of all other prospective uses combined." This statement is quite misleading. The economic analysis reproted indicates that the proposal for hydroelectric power development is distinctly uneconomic whereas the present useage of the water for irrigation is clearly economic. The water has, then, a much higher value for irrigation than for electric energy production. What is probably meant is that if the large dam were constructed and its cost were not taken into account, the value of hydroelectric energy that would be produced would be larger than the values of the water for other uses.

Flood reduction benefits

On page vii (paragraph 1) it is stated that the dam would attenuate floods from the tributary watershed and would reduce property damage by flooding at the mouth of Wailua River by about one-third. This statement at first seems at variance with the statement on page ix that the reservoir would not significantly attenuate peak fllod flows from the tributary watershed and hence that a large spillway would be necessary. The spillway would direct flood waters from the South Fork to the North Fork. Flood peaks would thus be decreased in the South Fork but increased in the North Fork whenever the reservoir was full. It would not seem that there would not be much change in the flood volumes passed by the River below the influence of the two Forks except in the case of floods whose peaks can be contained in the reservoir.

However, the synthetic hydrographs if figure 46 suggest that the peak flows of floods passed through the reservoir would be significantly reduced. This may be the basis for the estimate of the one-third reduction in flood damages near the mouth.

In estimating flood damages, any changes in the likelihood and extent of beach-bar blockage of the mouth of Wailua River should be taken into account.

Environmental effects

Aside from the flood-protection benefits, the only environmental effects evaluated in the report appear to be those associated with the recreational use of the reservoir (pages 64 et reg).

There seems to be no evaluation or even recognition of the loss of aesthetic recreational benefits through any reduction in the flow of water over Wailua Falls, a scenic attraction of which heavy use is made by the tourist industry as well as local residents, or over Kaholalele Falls, an even greater potential scenic attraction now difficult of access.

There also seems to be no evaluation or even recognition of any effects on biota of the Wailua River and its tributaries.

Flow estimation

The complexity of the destruction of stream gages in relation to diversions from and to the tributories of Wailua River has necessitated considerable analysis to produce estimates of mean and other flows. Use of a previous analysis by Davis, R.T., Major Streams of Kauai and their Utilization (University of Hawaii, M.A. thesis (Geography) 1960, 159 pp) might have been helpful. This previous work is not listed in the References of the report.

Yours truly,

Doak C. Cox

DCC/ck
cc: L. Stephen Lau, WRRC